NOTES ON INORGANIC CHEMISTRY.

In a recent number of the *Journal für Gasbeleuchtung* an account by M. van Breukeleveen and A. ter Horst is given, taken from *Het Gas*, of serious trouble from the formation of iron-carbonyl in water-gas mains. This Dutch works manufactures uncarburetted water-gas for use in Welsbach burners, and it is found that in a short time the mantel of the burner loses all its brilliancy owing to the deposition of a brown substance, which micro-chemical analysis proved to be iron. This proved to have been deposited from the iron-carbonyl formed, not in the process of manufacture of water-gas, but in its passage through the cold iron pipes, at ordinary pressure. The only practical remedy seems to be coating the interior of the pipes with tar. A similar deposit is often noticed on the lines used in the Drummond light, where instead of hydrogen, compressed water-gas or even coal gas in steel or wrought iron cylinder is used. Here the only remedy for the diminishing of the light consists in turning the lime quite often.

In the following number of the *Journal* Broockmann takes up the old problem of the gases contained in bituminous coal. At 100° E. von Meyer found a maximum of 238 cubic centimeters gas given off from 100 grams of coal, while Bedson found as high as 818 cc. The great variation in quantity as well as in composition is ascribed, in part at least, by Broockmann to the presence of more or less atmospheric air. He himself worked with a Sprengel vacuum which was kept with repeated warming for three days before the coal was heated, a temperature of 100° then being used. In this way a number of Westfalian coals gave from 7 to 150 cubic centimeters per hundred grams, an English coal 70 cc., a lignite from Habichtswald 50 cc. The gases obtained were generally chiefly methane with more or less carbon dioxid. Higher hydrocarbons, carbon monoxid, and oxygen were rarely present and then only in small quantities. One of the Westfalian coals gave little methane, more carbon dioxid, and over 60 per cent. of nitrogen. Two Oberschlesian coals gave a mixture of carbon dioxid and nitrogen, and the lignite gave 91 per cent. carbon dioxid and nine per cent. carbon monoxid. When heated with air in a closed tube to 160°–200° the oxygen of the air is completely absorbed, leaving only nitrogen with a very little carbon dioxid.

The precipitation of gold by iron pyrites is investigated by P. V. Gladkov in the *Berg- und Hüttenmannische Zeitung*. A solution of gold chlorid is completely precipitated by filtering through a layer of pyrites; if the pyrites carry copper, this and not iron replaces the gold in solution. The reduction takes place in pyrites which have been carefully washed by acid and hence is caused by the sulfid and not by any ferrous sulfate which might have been formed by weathering. The gold is precipitated not as sulfid, but as metallic gold, as is shown by the fact that it can be amalgamated with mercury. This study has considerable bearing on the treatment of pyrite ores of gold.

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CURRENT NOTES ON PHYSIOGRAPHY.

THE CHATTANOOGA DISTRICT.

The 'Physiography of the Chattanooga district, in Tennessee, Georgia and Alabama' is elaborately discussed by C. W. Hayes (19 Ann. Rep., U. S. G. S., Pt. II., 1–54, 5 colored maps). The mountains of post-Carboniferous deformation were reduced in Cretaceous time to a broad peneplain (the Cumberland) with scattered or grouped monadnocks; 'unakas' being suggested as a name for grouped residuals. General uplift of the region allowed the development a less extensive peneplain (the Highland-Rim) probably in Eocene time; and a still later uplift permitted the excavation of the present valley floors in Neocene time. The peneplains are referred to subaerial instead of to marine denudation, after a critical review of their origin. Special consideration is given the development and adjustments of the drainage system; the chief streams first flowed westward into an interior sea; then southward along the troughs of Appalachian deformation; then westward again as a result of the shifting of divides by stream action chiefly in the first and second cycles of gradation. It is pointed out that the Tennessee may in the future be once more turned southward